A Course of Modern Analysis. An introduction to the general theory of infinite processes and of analytic functions; with an account of the principal transcendental functions. By E. T. WHITTAKER and G. N. WATSON. Third edition. Cambridge at the University Press, 1920. Royal 8vo. 4 + 608 pages. Price 40 shillings.

The first edition of this work was by Whittaker alone in 1902 (16 + 378 pp.). The second edition in collaboration with Watson appeared in 1915 (560 pp.). "Advantage has been taken of the preparation of the third edition . . . to add a chapter on Ellipsoidal Harmonics and Lamé's Equation, and to rearrange the chapter on Trigonometrical Series so that the parts which are used in applied mathematics come at the beginning of the chapter. A number of minor errors have been corrected and we have endeavored to make the references more complete" (Preface).

Contents. Part I. The Processes of Analysis—Chapter I: Complex numbers, 3–10; II: The theory of convergence, 11–40; III: Continuous functions and uniform convergence, 41–60; IV: The theory of Riemann integration, 61–81; V: The fundamental properties of analytic functions; Taylor's, Laurent's, and Liouville's theorems, 82–110; VI: The theory of residues; application to the evaluation of definite integrals, 111–124; VII: The expansion of functions in infinite series, 125–149; VIII: Asymptotic expansions and summable series, 150–159; IX: Fourier series and trigonometrical series, 160–193; X: Linear differential equations, 194–210; XI: Integral equations, 211–231. Part II. The Transcendental Functions—XII: The gamma function, 235–264; XIII: The zeta function of Riemann, 265–280; XIV: The hypergeometric function, 281–301; XV: Legendre functions, 302–336; XVI: The confluent hypergeometric function, 337–354; XVII: Bessel functions, 355–385; XVIII: The equations of mathematical physics, 386–403; XIX: Mathieu functions, 404–428; XX: Elliptic functions. General theorems and the Weierstrassian functions, 429–461; XXI: The theta functions, 462–490; XXII: The Jacobian elliptic functions, 491–535; XXIII: Ellipsoidal harmonics and Lamé's equation, 536–578; Appendix, 579–590; List of authors quoted, 591–594; General index, 595–608.

Principles and Methods of Teaching Arithmetic. By J. R. OVERMAN. Chicago, Lyons and Carnahan, 1920. 6 + 350 pages. Price $1.60.

Contents: Part I, Introduction—Chapter I: The ends to be accomplished through the teaching of arithmetic, 1–9; II: The social ends in arithmetic, 10–18; III: The course of study, 19–45; IV: Types of teaching in arithmetic, 46–48. Part II, The Presentation of New Material— I: Methods of presenting new material, 49–53; II: The inductive development lesson, 54–66; III: The inductive development lesson—objective work, 67–73; IV: The deductive lesson in arithmetic, 74–88; V: The development of new ideas, 89–103; VI: The development of facts and principles, 104–120; VII: The development of rules and processes, 121–135. Part III, Fixing and Mechanizing, Facts, Principles, Rules and Processes—I: Methods of fixing—laws of habit formation, 136–141; II: Methods of securing and keeping attention in drill, 142–149; III: How to prevent the occurrence of exceptions to the desired habits, 150–160; IV: Accuracy and speed in the fundamentals, 161–174; V: Miscellaneous points on drill, 175–179; VI: Games, 180–196; VII: Measuring the mastery of the fundamental facts and processes gained through drill, 197–231. Part IV, Developing the Ability to Apply the Fundamentals of Arithmetic to Concrete Situations —I: The purpose of the problem work in arithmetic, 232–239; II: The nature and sources of problems, 240–255; III: Teaching pupils to solve problems, 256–274; IV: Form of written solutions—analysis, 275–283; V: Measuring the ability to use arithmetic, 284–299; Appendix, 300–333; Index, 335–340.

<div align="center">NOTES.</div>

Plane Geometry by H. E. HAWKES, W. A. LUBY, and F. C. TOUTON (Boston, Ginn. 8 + 305 pages; price $1.32) appeared in December, 1920.

The Cambridge University Press has published the concluding volume of Rayleigh's *Scientific Papers*, volume 6, 1911–1919.—From the Clarendon Press has come a fourth volume by HAROLD HILTON; it is entitled: *Plane Algebraic*

Curves (1920, 16 + 388 pages; price 28 shillings).—Another volume by Sir Thomas Heath (cf. *1921*, 133) appeared in the "Pioneers of Progress: Men of Science" series (London, Society for the Promotion of Christian Knowledge, 1921, 3 + 59 pages; price 2 shillings and 6 pence). It is entitled: *The Copernicus of Antiquity (Aristarchus of Samos)*.

About a year ago a semi-monthly publication *Princeton Lectures* was founded by Princeton University for distribution to its alumni. Each issue contains a lecture by some member of the Princeton faculty, an introductory note on the lecture, and a brief biographical sketch of the lecturer. In number two, published May 1, 1920, the lecture was "Modifying our ideas of nature" by Professor H. N. RUSSELL. The introductory note was on "The Einstein theory of relativity."

"Contributions from the Mathematical and Physical Departments" is the subtitle of *Bryn Mawr College Monographs*, volume 4 (1904) and volume 8 (1909). In 1915 the mathematics department of the University of Edinburgh published a series of eleven "Research Papers" which were reprints from various journals. This plan has now been followed in connection with *Publications of the Massachusetts Institute of Technology* with its "Contribution from the Department of Mathematics," serial II, nos. 1–16, May, 1920–February, 1921. These articles are reprinted from *Annals of Mathematics, Bulletin of the American Mathematical Society, Proceedings of the American Academy of Arts and Sciences, Proceedings of the London Mathematical Society, Proceedings of the National Academy of Sciences, Proceedings of the Royal Irish Academy, Proceedings of the Royal Society of Edinburgh*, and *Transactions of the American Mathematical Society*. Five of the articles are by Norbert Wiener, three by F. L. Hitchcock, two by Joseph Lipka, two by S. D. Zeldin, one by J. S. Taylor, two by C. L. E. Moore and H. B. Phillips together, and one by C. L. E. Moore alone. Although these "contributions" are labelled "serial II" there was no serial I. It was feared that the labelling of this series as "serial I" would imply absence of antecedent activity.

ARTICLES IN CURRENT PERIODICALS.

AMERICAN JOURNAL OF MATHEMATICS, volume 42, no. 4, October (published in December), 1920: "Geometrical significance of isothermal conjugacy of a net of curves" by E. J. Wilczynski, 211–221; "Observations weighted according to order" by P. J. Daniell, 222–236; "Some determinant expansions" by L. H. Rice, 237–242; "A general implicit function theorem with an application to problems of relative minima" by K. W. Lamson, 243–256; "On the Laplace-Poisson mixed equation" by R. F. Borden, 257–277; "Characteristic subgroups of an abelian prime power group" by G. A. Miller, 267–286.

ANNALS OF MATHEMATICS, second series, volume 22, no. 2, December, 1920: "The mean of a functional of arbitrary elements" by N. Wiener, 66–72; "On certain determinants associated with transformations employed in thermodynamics" by J. E. Trevor, 73–85; "The permanent gravitational field in the Einstein theory" by L. P. Eisenhart, 86–94; "On the structure of finite continuous groups with a finite number of exceptional infinitesimal transformations" by S. D. Zeldin, 95–100; "Conformal mapping of a family of real conics upon another" by T. H. Gronwall, 101–127; "On the location of the roots of the derivative of a polynomial" by J. L. Walsh, 128–144 [First sentence: "This paper contains some geometric results concerning the relative positions of the roots of a polynomial and those of its derivative. Although not entirely restricted to real polynomials, and although the cubic is especially treated in detail, most of the results here presented are naturally connected with the following theorem of Jensen's: